

DoD Corrosion Prevention and Control

Dynamic Strategies for Corrosion Prevention & Control

Army Corrosion Summit 2010

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- Take positive <u>action to prevent and control</u> corrosion
- Establish and implement effective corrosion management
- Pursue comprehensive corrosion <u>education</u> and training
- Perform ground-breaking corrosion <u>research</u> <u>and development</u>
- Develop a nation-wide anti-corrosion culture















- Prevent corrosion from happening
 - High percent of corrosion expense is downstream maintenance
 - Select corrosion-resistant materials
 - Design products to prevent or resist corrosion
 - Use production methods that don't induce corrosion
- Predict if and when corrosion will occur
 - Sense the onset and growth rate of corrosion
 - Forecast impact of impending corrosion
 - Develop and apply early mitigation strategies
- Detect and treat actual corrosion
 - Implement effective processes to detect corrosion
 - Select effective, long-lasting coatings and other treatments
 - Tailor corrosion repair or replacement to conditions & expectations















- Increase management recognition of impact of corrosion on performance, safety & readiness
- Acquisition managers need to know
 - Vulnerability of systems to corrosion
 - Effects of corrosion on performance, readiness and safety
 - Trade-offs to reduce/eliminate vulnerability
 - Life cycle costs of alternatives
 - Criteria for effective decision-making
- Operational managers need to know
 - All the above
 - How to establish corrosion requirements
 - How to select corrosion resistant systems





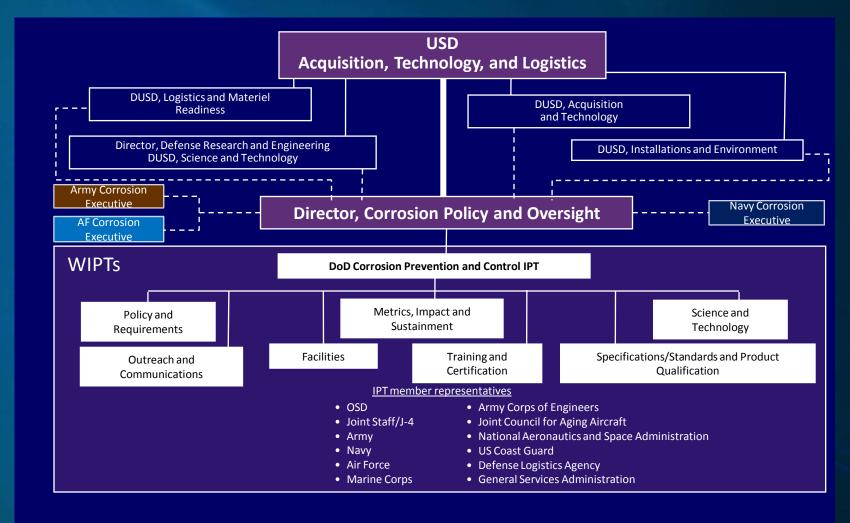








DoD Corrosion Organization

















- National Academies study
 - Assessed undergraduate corrosion education in engineering programs
 - Corrosion engineers only educated at the graduate level
 - Varied curricula and concentrations
- Corrosion engineering education
 - Critical mass of true corrosion engineers and scientists needed
 - Corrosion Engineering Degree at University of Akron
- Corrosion training expanded
 - NACE, SSPC and other technical societies are vital training resources
 - New corrosion training videos in use or development
 - Defense Acquisition University training managers and acquisition officials



- New, ground-breaking technology solutions are needed
 - Fundamental aspects of corrosion science and engineering not fully understood
 - Hard to reliably predict susceptibility and course of corrosion in materials
 - Advances are needed in fundamental research and basic understanding of corrosion
- Six universities collaborating in pilot program to address an array of basic and applied research needs such as
 - Environmental effects on coating formulations
 - Inhibitor-binder synergy
 - Corrosion resistance characteristics of Mg-rich primer
 - Environmental effects on corrosion
 - Accelerated lab test data relation to field data
- International university collaborations also underway















- Corrosion not accepted as inevitable
 - Recognized as insidious and pervasive
 - Can be prevented or treated
 - Can be detected
 - Can be predicted
 - Can be managed
 - Integrated state and national programs
 - Preserve and maintain infrastructure
 - Support corrosion research and development
 - Broad education and training
 - Design for corrosion prevention
- Significant outreach programs underway
 - Technical societies
 - Videos, games and podcasts















- DoD Corrosion Program has been autocatalytic
 - Produces self-reproducing emergent results
 - Depends on sound, new, dynamic strategies
 - Success achieved through prior implemented strategies
- Recognition by GAO and Congress for
 - Institutionalized and documented modern corrosion management policies and methods
 - Validating the extremely high annual DoD cost of corrosion of over \$22 billion
 - Certifying savings of over \$6.37 billion on 169 R&D projects during six years, with a 50 to 1 ROI
 - Army projects show \$2.7 billion savings on 72 projects, by investing \$32 M with DoD's \$29 M for a 48 to 1 ROI















- Emphasize corrosion prevention
- Increase DoD management recognition of impact of corrosion on performance, safety & readiness
 - Focus on high-cost causes of corrosion
 - Slash the DoD cost of corrosion by increasing investment in high-payoff, high impact projects
- Create a critical mass of true corrosion engineers and scientists
- Generate new, effective technological solutions
- Develop a national anti-corrosion culture
 - Implement expanded outreach programs
 - Facilitate added cooperative inter-service, inter-agency and international corrosion programs











